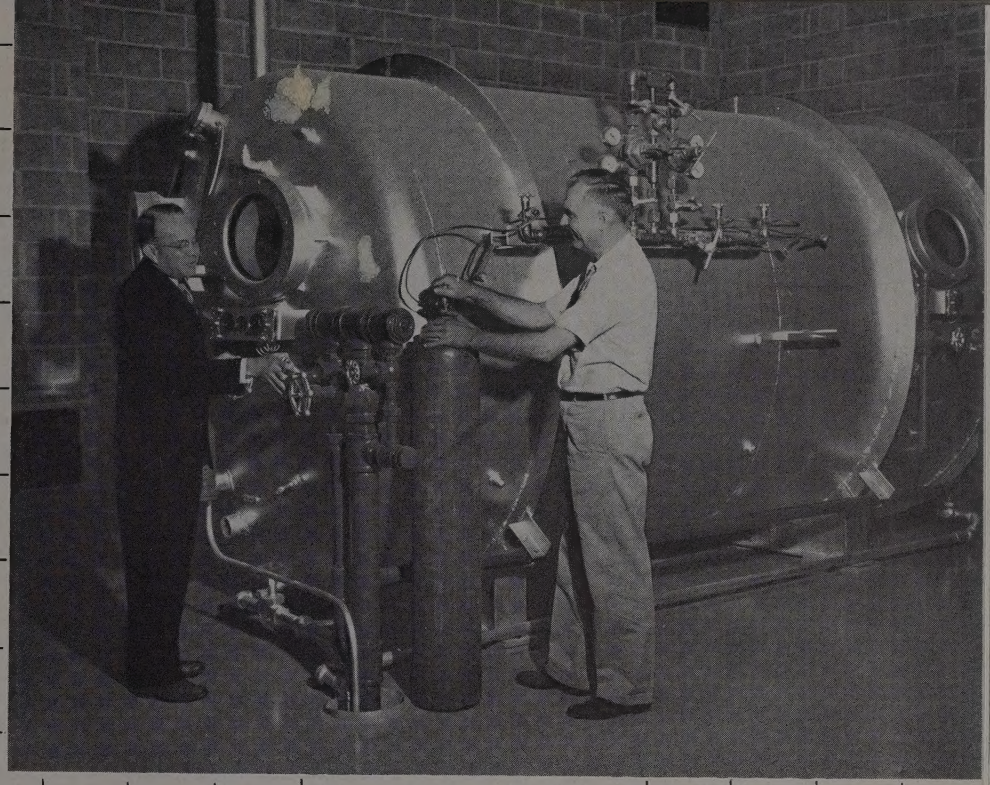
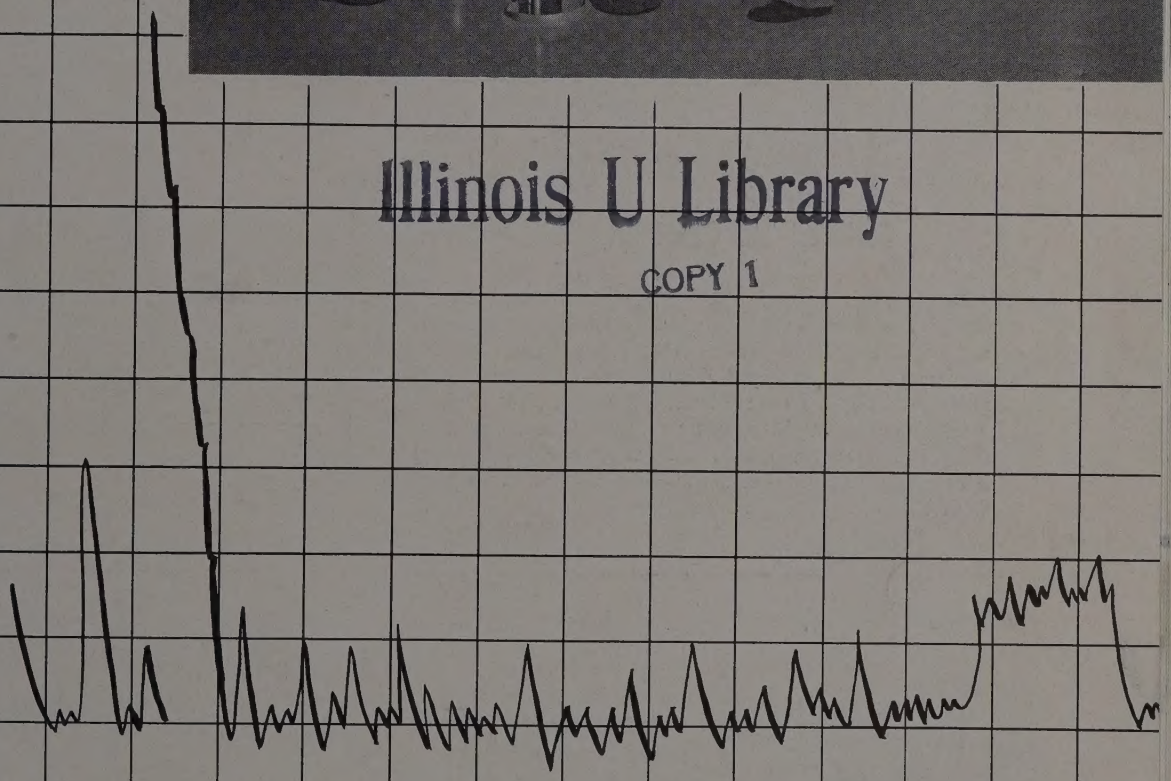
25¢



Illinois U Library
COPY 1

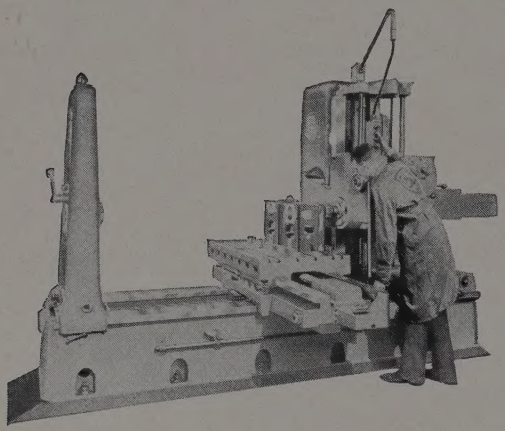


the illinois technograph

mber
m.a.

january, 1951

Another page for **YOUR BEARING NOTEBOOK**

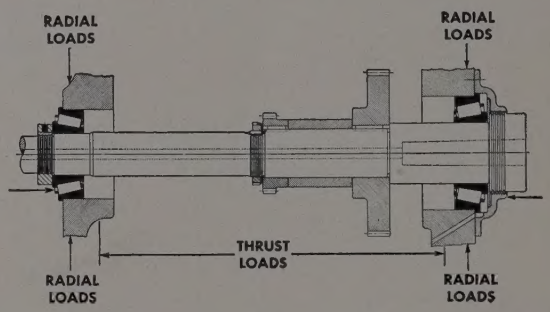


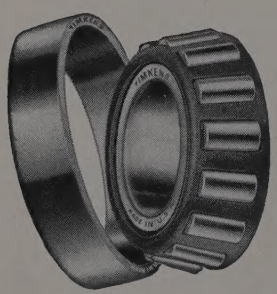
Rigid rule for spindles

Machine tool engineers have to design for maximum spindle rigidity to insure extreme, long-lasting precision. That's why most of them make it a rule to mount the spindle on Timken® tapered roller bearings. Timken bearings keep the shaft in positive alignment, minimize friction and maintain original precision—normally for the life of the machine.

How TIMKEN® bearings hold shafts in alignment

Because a Timken bearing has *tapered* construction, it carries radial loads, thrust loads and combinations of both. End-play and deflection in the shaft are practically eliminated. *Line* contact between the rollers and races of a Timken bearing provides a wider, more rigid support for the shaft. These features are two of the reasons why machine tool bearing applications can be handled more efficiently with Timken bearings.





TIMKEN

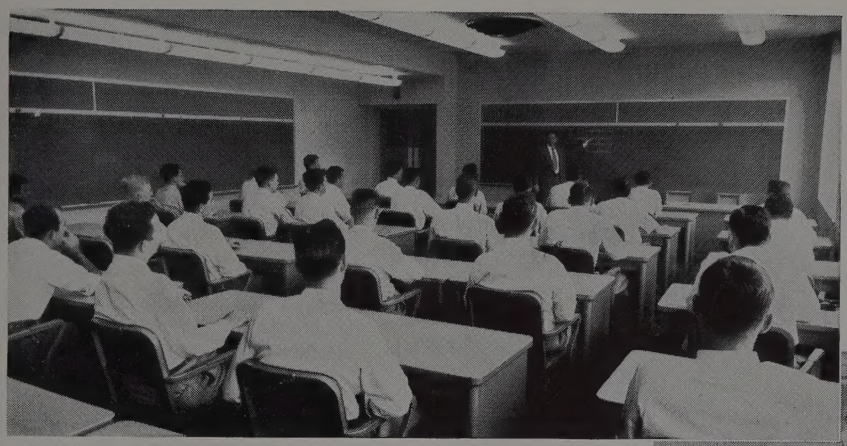
TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

Want to learn more about bearings?

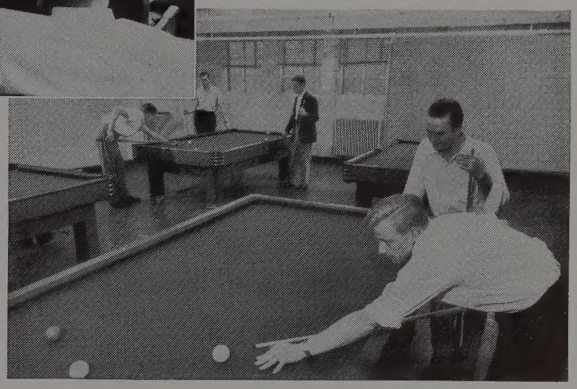
Some of the important engineering problems you'll face after graduation will involve bearing applications. If you'd like to learn more about this phase of engineering, we'll be glad to help. For additional information on Timken bearings and how engineers use them, write today to The Timken Roller Bearing Company, Canton 6, Ohio. And don't forget to clip this page for future reference.

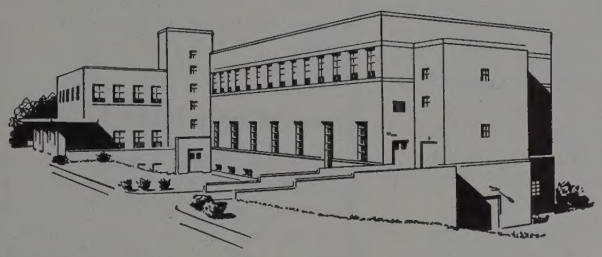
NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION ✳



A typical scene in one of the several modern classrooms in the new Educational Center Building.

Billiard room below is one of many facilities provided for recreation and relaxation. Such activities set the stage for lifelong friendships.





To Give Men A RUNNING START ON THE WAY TO THE TOP

Westinghouse accepts a responsibility to the top-notch men it employs for engineering, manufacturing, research and sales jobs.

Here are the ways Westinghouse helps. Through a comprehensive orientation and training program, we give our new men a panoramic view of the electrical manufacturing industry . . . a broad knowledge of the products of Westinghouse, an appreciation of the research, engineering and manufacturing that go into those products, and an understanding of the marketing that gets them to the ultimate user. Hundreds of experienced professional people help carry out this program . . . through planned conferences and actual work assignments. In this way, new men get a running start in their new work.

To help speed them along their way, a Graduate Study Program is also made available through which advanced degrees may be obtained. This program has been worked out with a number of leading universities in major Westinghouse locations.

Headquarters for these activities is the new Educational Center, where a sizable staff devotes its entire attention to developing future leaders for the company. With this new facility, and the impetus that years of building for the future has given, we look forward with confidence to the years ahead.

G-10118

WESTINGHOUSE ELECTRIC CORPORATION, PITTSBURGH 30, PA.

YOU CAN BE SURE.. IF IT'S Westinghouse

skimming industrial headlines

edited by Bob Hardin, E.E. '54

"magnetron" tube

A tiny electronic tube, similar in principle to those used in radar and in quick-cooking electronic ovens, has been developed by General Electric Company engineers for use in ultra-high-frequency television receivers.

Ultra-high-frequency channels, when released for use by the Federal Communications Commission, will require a special tube to convert the UHF signal to a usable frequency.

The tube, designed by GE engineers to do this, "beats" down the UHF signal by sending out its own signal which, when mixed with the UHF signal, produces a resulting lower frequency.

Mass production of the miniature "magnetron" tube will be timed with the FCC's release of the new UHF channels.

The new application marks the first consumer use for the magnetron type of tube, a joint development of the company's Research Laboratory and Electronics Department.

The new tube will operate in the present "standard band" between 60 and 216 megacycles as well as in the UHF channels which may be assigned as high as 900 megacycles.

The tube will be usable for color television in addition to black and white.

synchronized sound

It is now possible to use many of the non-synchronous ¼" magnetic tape recorders for picture-synchronous sound-track recording. A control track generator manufactured by the Fairchild Recording Equipment Corporation of Whitestone, New York, superimposes a high frequency signal on the magnetic tape simultaneously with the sound track. The high frequency signal becomes the tape speed control during the playback, acting as a sort of electronic sprocket. When played back on a Pic-Sync recorder, this control track compensates for tape stretch and shrink, maintaining lip-synchronization between sound-track-on-tape and picture-on-film. No modifications to presently owned tape recorders are required. This unit is supplied in a small carrying case, and is available for immediate delivery.

oil additive

A preservative for soluble-type cutting oils and coolants, proved in field tests to be highly effective against the development of rancidity and obnoxious odors, has been introduced by the West Disinfecting Company.

The new oil additive is an odorless formulation that inhibits the growth of bacteria, stabilizes the emulsion, and preserves the lubricating qualities of the oil for its full life. In actual cases, normal use of coolants has been increased from two or three days to a period of three weeks when this additive has been used.

Where municipal sanitary codes are in effect to regulate the disposal of spent cutting oils in public sewers or streams, this disposal problem may now be satisfactorily answered, because bacteria counts are kept to a minimum.

diesel-electric drivers

A machine with no clutch, no transmission, and no differential, and which incorporates a new method of power transmission as used on heavy construction equipment—that's the new electric drive Tournatow, just announced by R. G. LeTourneau, Inc., Peoria, Ill.

The Tournatow has no self-contained source of electric power. It uses its own diesel engine to generate its own power. Its alternating and direct current generators are driven by its diesel engine, and provide power for all steering, forward, reverse and lateral movements of the machine.

This self-generated current is conducted through electric wires to an electric motor and gear arrangement contained in the assembly of each of its four wheels. There are only four moving parts in each wheel—the pinion, 2 reduction gears and the internal gear within the wheel.

The effectiveness of its system of drive is attested to by the tremendous pull it can exert. In a recent demonstration conducted for the Air Force at Wright Field, Dayton, O., the machine developed a pulling power sufficient to maneuver giant aircraft weighing approximately 400,000 pounds, which is more than 16 times the weight of the Tournatow.

So powerful are the A.C. motors that one 11 inches in diameter can develop 50 horsepower. These motors develop instant pulling power, and can accelerate from standstill to a top speed of 3600 revolutions per minute in 1/6 of a second. They can stop and reverse themselves to 3600 r.p.m. in 1/4 of a second.

streamlined light bulbs

A 150-watt indirect lightbulb recently developed by Westinghouse has introduced a "new look" in home lighting. For several decades, light bulbs have changed little in shape and appearance. The new indirect bulbs, however, present something new in design. In shape the bulb rsembles the standard flood lamp, but inside the reflector there is a special silica coating designed to give greater diffusion of light rays. In order to give more diffusion downward, the coating on the side of the bulb is more dense than that on the bowl. This minimizes the direct or reflected glare. The streamlined light bulb fits any standard socket, and can convert almost any household lamp to higher illumination.

U.I. tool-cutting research

Manufacturing processes which involve metal cutting in lathes or with turning tools will benefit from a report made by a University of Illinois professor at the American Society of Mechanical Engineering convention.

Application of data from this fourth in a series of reports based on six years of research at the University will improve metal-cutting processes and lengthen cutting tool life.

It was presented by Prof. K. J. Trigger, co-author of the report with Prof. B. T. Chao. Both are of the mechanical engineering department at Illinois.

The temperature at the point where the tool cuts into the metal is very important, the report explained, relating the factors of material being worked, cutting tool, and working speed. Included in the paper were charts relating various factors in machining of metal.

editorial staff

editor
Connie Minnich

associate editors
Gene Blanyer
Richard Choronzy

assistant editors
Dean Felton
John Huber

makeup editor
Bill Black

art editor
Ed Lozano

assistants
Dave Cash
Joe Enrietto
Bob Hardin
Bob Johnson
Hank Kalapaca
Clarence Niebow
George Ratz
Bob Schrader
Henry Spies
Don Sweet
Tom Tucker
Jack Ullman
Charles Wade
Bob Lawrence
Sue Wahlstrom
Bob King

business staff

business manager
Bill Anderson

assistant manager
Dick Kenna

assistants
Marvin Ehlers
Charles Fitzgerald
Dwight Moberg
Elwood Schmidt
Dick Spalding
Eric Aagaard
John Anderson

faculty advisers

J. A. Henry
W. E. Hanson
G. R. Foster

MEMBERS OF ENGINEERING COLLEGE MAGAZINES ASSOCIATED

Chairman: Prof. F. J. Cheek, Jr. University of Kentucky, Lexington 29, Ky.

Arkansas Engineer, Cincinnati Cooperative Engineer, Colorado Engineer, Cornell Engineer, Denver Engineer, Drexel Technical Journal, Illinois Technograph, Iowa Engineer, Iowa Transit, Kansas Engineer, Kansas State Engineer, Kentucky Engineer, Louisiana State University Engineer, Manhattan Engineer, Marquette Engineer, Michigan Technic, Minnesota Technolog, Missouri Shamrock, Nebraska Blueprint, New York University Quadrangle, North Dakota Engineer, North Dakota State Engineer, Ohio State Engineer, Oklahoma State Engineer, Oregon State Technical Record, Penn State Engineer, Pennsylvania Triangle, Purdue Engineer, Rochester Indicator, Rose Technic, Wayne Engineer, and Wisconsin Engineer.

Published eight times during the year (October, November, December, January, February, March, April and May) by the Illini Publishing Company. Entered as second class matter, October 30, 1920, at the post office at Urbana, Illinois, under the Act of March 3, 1879. Office 213 Engineering Hall, Urbana, Illinois. Subscriptions $1.50 per year. Single copy 25 cents. Reprint rights reserved by *The Illinois Technograph.* Publisher's Representative—Littell Murray-Barnhill, 605 North Michigan Avenue, Chicago 11, Ill. 101 Park Avenue, New York 17, New York.

the illinois technograph

volume 66 **number 4**

contents:

skimming industrial headlines ---- 2

how's your english? ---- 5

U. of I. research ---- 6

electric jacks ---- 7

navy pier ---- 8

boneyard bilge ---- 9

introducing ---- 10

honorary and society news ---- 11

editorial ---- 12

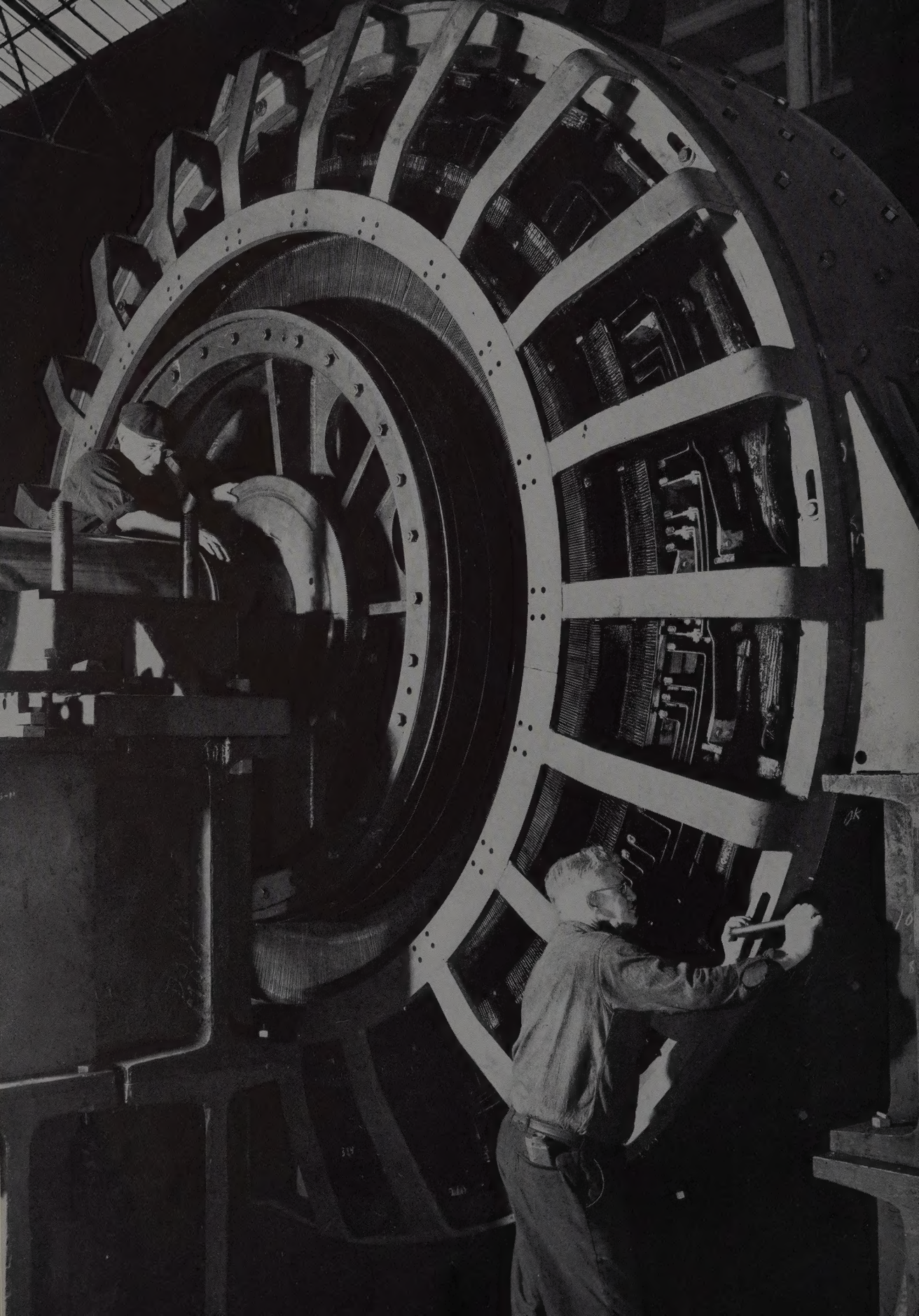
technocracks ---- 24

our cover

This atmospheric tank, located in the Physical Environment Lab of the old Mechanical Engineering building, can simulate conditions of altitudes as high as 40,000 feet. Under the direction of the mechanical engineering department, this tank is used in experimentation by many of the other departments, particularly in phases of psychological and hereditary research. (Photo courtesy of Public Information Office).

our frontispiece

This 3,000 horsepower motor, believed to be the largest mine hoist motor in physical size ever built in this country, is being assembled for test at Schenectady. Capable of lifting 12 tons of ore nearly half a mile a minute, the motor will be shipped to Anaconda Copper Mining Company at Butte, Montana. (Courtesy of General Electric).



how's your e n g l i s h ?

Before a small group of solemn-faced engineering faculty last December 12, the following "degree" was conferred by Dr. W. L. Everitt, dean of the College on Engineering:

COLIC OF ENGINEERING
University of Illinois
"Learning Is Labor"

The members of the Engineering Seminar on Student English, Fall Semester, 1950, in grateful appreciation of the tremendous, stupendous, colossal (large), efforts to educate them by

CHARLES WALTER ROBERTS

do hereby confer upon him the onery degree of

HORSE DOCTOR IN ENGINEERING
(*signed*)
W. L. Everitt, Dean
Ellis Danner, Chairman
December 12, 1950

The presentation of this "degree" wound up the final meeting of a ten-session Engineering Seminar on Student English. Comprised of a limited number of faculty representatives from each of the engineering departments, the seminar was held for the first time this year.

The written and spoken word remains the most facile means of the conveyance of ideas. Blueprints and engineering drawings still take a back seat to the more important engineering specifications and reports.

Inability to write such a report and to express themselves orally has been one of modern industry's biggest complaints about recent engineering graduates. Ignorance of even the elementary rules of grammar has been a hindrance to the average engineer's status. The more responsibility and administrative burden that a man assumes, the more clearly and consciously he must be able to express himself both to his superiors and to those under his command.

In an effort to correct this situation among undergraduate engineers, the College of Engineering committee on Student English was appointed, with a representative on the committee from each department. This committee has worked on the basis that improvement in both the oral and written expression can be brought about by emphasis of good English usage in the day-to-day teaching program.

The seminar was instituted for the study of teaching methods to attain this end. Professor Charles W. Roberts of the English department, assisted by Professor Paul N. Landis, acted as seminar director and presented various suggestions and plans to the group. Participants felt that the seminar had achieved its original objectives which were outlined as:

"1. Emphasize to the participating members the importance of students acquiring the ability to convey clearly and accurately.

"2. Outline of general methods and specific procedures for creating student interest in good expression and for teaching the students how to convey their ideas in proper and understandable language.

"3. The exchange of ideas concerning problems involved in training students to make the most effective use of their tools for expression."

Some of Professor Roberts' final recommendations to the committee were:

1. Announcement by the instructor early in each term and before every test or written assignment that he places considerable value on correctness and effectiveness in writing.

2. To give students every opportunity to exercise their writing abilities by encouraging students to take neat and readable lecture notes and asking for brief written reports on reading or laboratory work.

3. To refer to the University Writing Clinic all upperclass students conspicuously deficient in writing ability.

4. To grade down or refuse to accept papers which reveal inadequate mastery of English expression.

5. To encourage mastery of technical vocabulary.

The seminar will be repeated in coming years for the benefit of faculty members who, due to the necessarily limited size of the group, were not able to attend this year. Members of the group for this year were: Prof. Ellis Danner, chairman; Prof. George E. Pickard of the agricultural engineering department; Prof. John M. Coan from aeronautical engineering; William J. Meid of ceramic engineering; Prof. William A. Oliver and William S. Pollard representing the civil engineering department; Clarence L. Coates and Profs. Robert S. Elliot, Paul K. Hudson, Wendell E. Miller, and Harold D. Webb, electrical engineering; Prof. Leonard D. Walker and Allan C. Friederich from general engineering drawing department; Everett E. Garrison, David H. Offner, Robert L. Wehe and Profs. David H. Cole and John A. Henry, mechanical engineering; Prof. Earl J. Eckel of mining and metallurgical engineering; Charles P. Slichter and Profs. Leo S. Lavatelli and Robert D. Rawcliffe from physics; and Prof. Lisle A. Rose and George R. Foster from the Engineering Experiment Station.

TECHNOGRAPH tours . . .

U. of I. research

The University of Illinois has long been noted as one of the outstanding engineering schools of the country, not only for its program of undergraduate training, but also for its graduate work and for the tremendous amount of research that is being conducted in the different engineering departments.

It is virtually impossible to list all of these phases of research. Certain experiments being conducted under government military contracts are still classified as secret. Others are only minor bits of work that involve two or three weeks by one person before the project is completed. However, there are those phases of research that have given the University an engineering halo in the eyes of the public, which has read of the new betatron or digital computer, and similar awe-inspiring developments.

This article covers only a few of the largest programs that are now under way.

betatron research

Last year the University came forth with another one of its "firsts," the largest and most powerful atom-smasher in the world—the 500-million volt betatron. As distinguished from the University cyclotron, the betatron creates energy by the acceleration of electrons through the use of a giant magnet, while the cyclotron causes proton acceleration.

This 400-ton piece of machinery is expected to open the doors of one of the latest phases of nuclear research—investigation of the meson, or "atomic glue" as it is called. The experimentation is expected to bring solid proof to the theory that the atom structure is bound together by this "glue."

Housed in a specially-protected room in the Betatron Laboratory out by Memorial Stadium, the machine is 12 *ft* high, 23 *ft* and six *ft* wide. Twenty-foot compounded earth and brick walls separate it from the rest of the building.

Present research on the meson is under the direction of Professor Donald W. Kerst, a member of the physics department and inventor of the betatron.

shock wave research

A shock tube that allows the study of phenomena occurring at speeds up to 1.8 times the speed of sound has been completed by the aeronautical engineering department. Similar to a supersonic wind-tunnel but much smaller and less expensive, it will be used for research in supersonic aircraft and missiles as well as high velocity wave-movements and flow.

Shock waves are set up in the tube by increasing the air pressure behind a thin membrane of tough plastic stretched across one end of the tube. When a pin pricks the plastic, the material splits in all directions like a burning balloon and the resulting shock wave rushes through the length of the tube faster than the "bang" sound can follow.

Inside the tube at the low pressure end, there is a model of an airplane wing, a rocket, or some similar shape that is under experimentation. A precisely-timed spark flashes light through windows to photograph air motion as the wave strikes the model. Air movements show up on the picture like shadow patterns on a wall.

A delicate instrument which splits the light from the illuminating spark, detouring some of it around the tube while the rest of it goes through the shock wave, will reveal facts about the wave, including its speed.

Professor Walter Bleakney, visiting Princeton University physicist, is at present in charge of the work that, like the electronic digital computer, is financed by Graduate College funds.

heating and ventilating

Heating and ventilating has been a large phase of research carried on by mechanical engineers here at the University. They have played a leading role in developing such home heating innovations as radiant baseboards and ceiling panels, as well as in designing major ventilating systems such as those in use in the Holland Tunnel in New York and the Chicago subway. In addition, Professor Julian R. Fellows has invented a smokeless furnace which burns any solid fuel and reduces smoke by 90 per cent. A few years ago 1500 American homes were the first ones to be heated by this smokeless furnace.

Research in home heating has bee carried on for a number of years in t experimental residences which simula

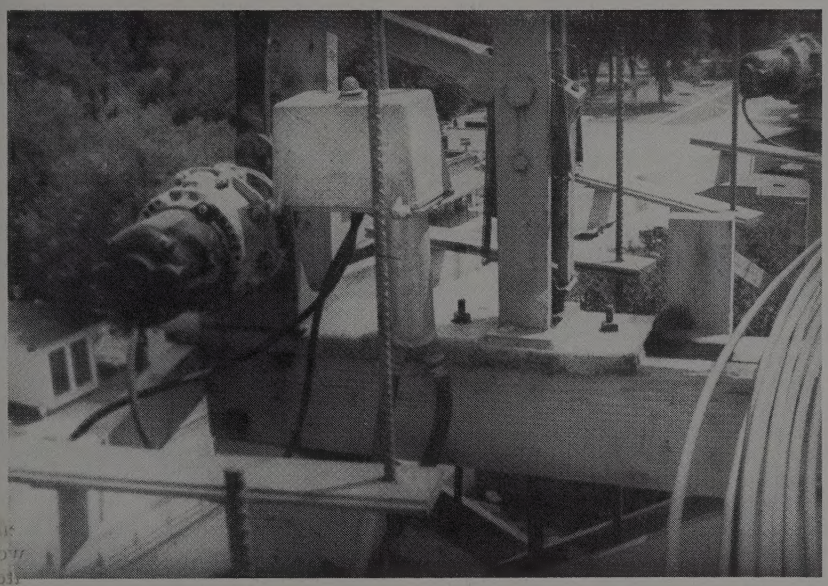
(*Continued on Page* 18)

A laboratory assistant lifts a "frit" pot out of a refractory crucible in the ceramics lab. These pots are used for melting down batches of porcelain enamel and glaze frits so that soluble impurities are complexed into silicates, at a temperature of 2000° F.

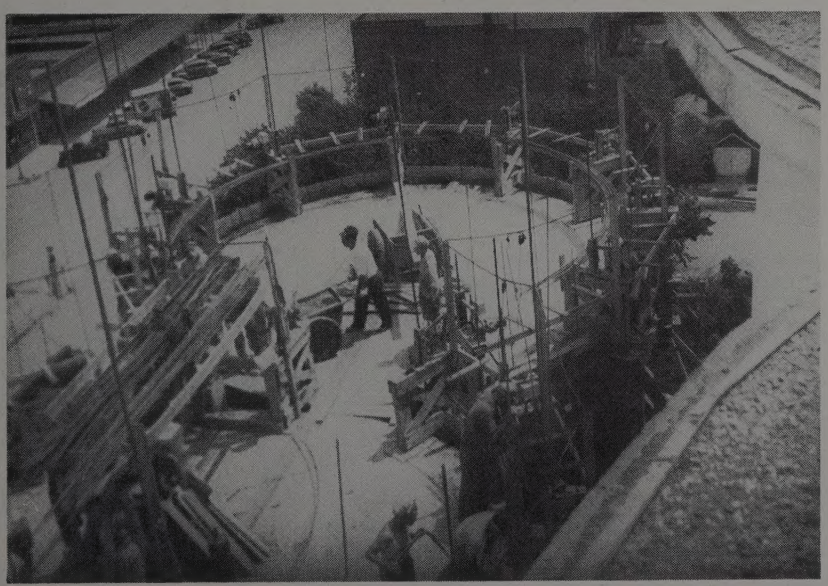
slip form concrete by . . .

electric jacks

by James Stein, C.E. '51



The control chamber of the jack is closed in this picture. The light on top of the control chamber goes on when the motor starts operating. A mercury switch, float chamber and hose connections to the control tank constitute the mechanism under the rectangular hood next to the motor.



Jacks are spaced at eight-foot intervals about the slip-forms. Vertical reinforcing bars are placed in between the jacks and are stored in the overhead racks beforehand. Horizontal curved steel is racked along the side of the platform awaiting its turn.

One of the more interesting developments in the field of concrete construction practice has been the use of electric jacks on jobs using slip forms. These jacks have only been in use the last two years but they have proved to be superior to hand-operated jacks and the labor cost is considerably less.

The accompanying photographs show the use of these jacks on a concrete grain elevator at Meredosia, Illinois. The jacks are connected to the inner and outer forms by a yoke and a one-inch solid steel rod is used as a jack rod. The jack rods run down through the center of the concrete wall to the foundation. The entire weight of the forms, the equipment and men working on the forms is supported by these steel jack rods. The green concrete is some aid in preventing side-sway of the forms but actually does not bear any of the weight.

In ordinary slip form construction the jacks are operated by hand. One laborer may operate from six to eight jacks depending upon the size of the job and how fast the concrete is being poured. On this job, the electric jacks enable the contractor to reduce his labor force by five or six men. He was, however, required to hire an additional electrician to operate the jacks.

The operation of the jacks is extremely simple. When the walls are started, the float chambers that operate the mercury control switch on each electric jack motor are at the same level and all floating chambers are connected by hoses to a central control tank. The entire system is then filled with water. As the water tends to seek its own level, the level of the water in all float chambrs rise to the same level as that in the central control tank.

When it is desired to raise the forms two or three inches (or as required) the control tank is elevated the exact amount required. When this is done, the water in the central control tank drains into the hoses and raises the level of the water in the float chambers. The float in the chamber actuates the mercury control switch which in turn starts the motor at each jack. As each jack rises, the water in its float chamber drops until the required height is reached and at this point the float again actuates the mercury control switch and the electric motor is stopped.

the university of illinois at . . .

navy pier

by Ray Lindahl, Arch.E. '54

Harvard on the Rocks

In this day and age of suffering, we must take the good with the bad. We therefore will accept some good designs for buildings along with the Zebra Caps and these "Words of Wisdom" borrowed from the Archies Bulletin. "In the old days, when a fellow told a girl a naughty story, she blushed. Nowadays, she memorizes it."

Art Appreciation

Even in our country with its many inventions, we still have a skid row in every city, town or what have you. "Harvard on the Rocks" is no exception. We find ours in the halls by the Art department. Here the Archies view the latest developments in design that are being added to the old framework. It seems that this pastime adds to the creative abilities of these worshipers of art.

Geniuses

An unnamed protege of King Neptune (Pier student to the illiterates) has developed this guaranteed formula by which you can get out of the miserable situation that occurs when an instructor asks you a question in a class in which you have been dreaming about a blonde. The best answer is, "Well, it is like this, pal." According to this theory, in the excitement that follows, you can go back to your dreams and the instructor will not bother you again that hour.

We have not been able to find out whether our great researcher is still in school. It is entirely possible that the instructor may not bother you again for the rest of your life.

Come the Revolution

Engineers, we are ashamed of you! Have you no school spirit? In the next student election, we, the direct descendents of St. Pat, should organize a political party of engineers. The time has come for cooperation between the various engineering fields and societies. Let us unite our manpower toward the goal of freeing our school and its government from the shackles of the LAS and Commies and start running this school in a safe and sane way.

Santa

Some intelligent (?) engineer had started the rumor, during the holiday season, that Santa Claus was approached by a group from the AA for the "cure." Some people could not believe that his red nose was from a cold.

Engineering Societies

ASME

The Navy Pier branch of the ASME has supplemented its meetings in this last month with an extraordinary program of field trips. The program was designed as a means of enlarging the student engineer's knowledge of industry and industrial processes.

On Tuesday, December 21, members of the ASME toured the Hills McCanna Co. This is a small magnesium foundry and machine shop, and the engineers saw practical applications of their lab work.

The group took a very informative trip through the Electromotive Co. plant in LaGrange, Illinois, on December 27. On the invitation of the International Harvester Co. the ASME visited its Chicago Tractor Works. The members had an excellent opportunity to view all the operations in producing the finished product from raw materials.

The organization has arranged for an inspection trip to the Allis-Chalmers plant in Milwaukee, Wisconsin, on January 31. The trip is open to the Pier's engineering societies and will leave the Pier by bus at ten o'clock. They will have lunch at the plant and spend the remainder of the afternoon watching its operation.

AIEE-IRE

During the November 21 meeting, Mr. Kimberly, staff engineer for the Commonwealth Edison Co. gave a speech entitled, "The Job of Supplying Electricity to Chicago." He vividly described the growth of power stations serving the Chicago area, and then related some of the problems involved in changing the power supply in parts of Chicago from DC to AC current. The meeting was closed after an open discussion period.

The meeting of December 5 found the society viewing two films produced by the Westinghouse Corporation. They were entitled "The Banshee" and "On the Air."

The December 19 meeting was a social event at which two animated comedy movies were shown. The titles were "Big Jim" and "Gasoline's Amazing Molecules." This entertainment was followed by cokes and donuts.

AIA

The AIA student chapter is still talking about the wonderful time it had at the "Zebra Capers" held at Como Inn last month. We congratulate the fine job accomplished by the many who gave of their time.

On December 5, a great architectural historian, Mr. Henry-Russell Hitchcock, spoke to the members of the department. He is professor of art at the Smith College Museum of Art and a lecturer in architecture at Massachusetts Institute of Technology. He is also the director of the College Art Association and the Society of Architectural Historians.

Mr. Hitchcock spoke on the changes in the interpretations of a style of architecture labeled as the "International Style." Even though he and a co-author defined the style in a book several years ago, many of its basic concepts are still present in the architectural interpretations of today.

ASCE

The society is in the midst of a membership drive to have all the civil engineers as active members. It is quickly approaching its goal.

In the past semester, prominent local engineers have spoken on the topics of "Use of Rail Steel in Reinforced Concrete Construction," "The Lakefront Filtration Plant, and Modern Structures with Ready-mixed Cement."

Recent events that received widespread participation were the ASCE dance held at the end of November and a gala Christmas party held on December 19.

The officers are Otto Larson, president; Benjamin Sovoboda, vice president; Howard Holzer, secretary; and Gerald Rosenthal, treasurer. J. C. Chaderton is the faculty sponsor.

"What did you name your baby, Mose?" a friend inquired of a proud new father.

"Electricity," said Mose.

"Odd name," said the friend, "why did you name him that?"

"Well, mah name is Mose and mah wife's name is Dinah, and if dynamos don't make electricity, what does they make?"

by Chuck Wade, M.E. '52

Just what is all that maze of new channels going up in the Physics Lab? The *Tech* had been wondering about that, as you probably have, so we decided to investigate. When we found Dr. Robert Hulsizer, who is on the committee for wiring improvement of the Physics building, we got the straight "dope" about the new wiring that they are going to put in to replace the old worn-out wiring and the new circuits that are to greatly increase the research capacity of the many labs.

The wiring is essentially the same as that which was placed in the building when it was built in 1908. The physics staff has more than quadrupled and each man on the staff is doing much more research now than previously.

There now remain only ten teaching rooms in the Physics Lab, the rest have been converted into research labs for the use of the personnel of the physics department. This increased number of labs has necessitated the addition of many new wires to supply the additional electricity which the equipment uses. The present transformers are loaded to their capacity, so instead of adding one more small transformer, it was decided that the best thing to do would be to replace the many transformers now in use by one large one capable of handling all the present current and all the expected additional current which will be needed in the near future.

The basement of the Physics Lab is being revamped to make space for the new transformer and its control panels. The big 500 KVA transformer has already been placed in its fireproof, waterproof cement vault, which is equipped with outside controls which may be used to open the circuit in any emergency.

In the room next to the transformer, is to be placed the big distribution panel and the three motor-generator combinations to furnish 600 cycle AC, 120, 125, and 250 volt DC. The 600 cycle line is to be used for special equipment in the labs.

Adjacent to the main panel is a secondary distribution panel which will supply the various currents to all the rooms in the EE motor lab. From each lab in the building, there are to be three pairs of wires which will lead to this distribution panel. The wiring to handle the normal lighting in the building will also pass through this panel.

The Physics Lab has for its supply of constant current DC, 80-2 volt lead storage batteries which can be made to furnish from 2 to 160 volts. These batteries are automatically charged so that they require very little attention. The batteries will be connected to the secondary distribution panel for distribution throughout the building.

From this center, which will bring 3 phase current into the Physics lab for the first time, black, square conduits which can be seen in the first floor corridor, will rise from the basement to the fourth floor of the building. In these conduits will be placed the lines to all the labs in the building. When the work is completed, these conduits will be plastered to harmonize with the rest of the building.

In each of the main labs, there will be another substation to distribute the power where it is needed. All of the labs will have a power panel into which leads may be placed to deliver electricity to the equipment. Also being installed in all of the rooms are electrical outlets at three foot intervals around the walls to provide adequate outlets for the phycists. At the end of each of the halls will be placed a control box which will contain a circuit breaker for each of the rooms which are supplied with power.

In the not too distant future, there will be less necessity of the researchmen being high jumpers or contortioninsts when they want to move around in their labs, since the wiring improvements will enable them to have their apparatus placed in more advantageous positions.

* * *

The Bible says that when two become married, they become one, but Reinhold Neibuhr asks, "Which one?"

FLUSH YE BONEYARD

Intuition may be a good thing in a woman, but it doesn't do an engineer any good.

* * *

Welding Paper Contest

The fourth competition in the Annual Engineering Undergraduate Award and Scholarship Program has been announced by the James F. Lincoln Arc Welding Foundation, Cleveland, Ohio. The dates for the competition have been extended this year to include one entire year, June 1, 1950, to May 31, 1951.

All resident engineering undergraduates registered in any college offering a degree in any branch of engineering (including agricultural and architectural) are eligible to participate. Awards totaling $6,750 will be made for the best papers on arc welding design, maintenance, fabrication or research. Awards range from $1,000 to $25 for students, and duplicate awards in scholarship funds will be made to the schools in which the main award winners are enrolled.

The Foundation states that it is not necessary to know how to weld or to be enrolled in a course studying some phase of welding. The purpose of the program is to stimulate independent study and investigation by engineering undergraduates into the science of arc welding and its possible application in industry and agriculture.

Rules for the program are available in an illustrated booklet giving suggestions for paper subjects, bibliography, and examples of award winning papers. For further information, stop in at the *Tech* office, 213 CEH.

introducing . . .

by Bob Hardin, E.E. 54;
Henry Spies, Ag.E. '52;
and Bob Schrader, M.E. '54

ED LOZANO

Remember those cartoon covers on last year's editions of the *Technograph?* They were all drawn by Ed Lozano—cheerful Ed, with a cartoon in one hand and an *Illumination Engineer's Handbook* in the other, and plenty of ideas about both.

Ed has been with the *Technograph* for two years. This semester he is serving as art editor.

Ed Lozano hails from Chicago and Lane Technical high school. He has always been interested in art work and

EDMUND LOZANO

attended the Art Institute in Chicago for a year when he was twelve years old. He was a member of the Chicago City YMCA championship swimming team in 1942. He graduated from high school in 1944, and enlisted in the Air Force two months later. Before he was discharged in May, 1946, he spent eight months in the army of occupation on Okinawa.

Ed attended Wright Junior College in Chicago during the summer of 1946. As a Navy Pier alumnus, he came to the University of Illinois at Champaign in September, 1948. Ed is an illumination option EE major.

Besides his work toward that B.S. degree, his interest in art, and his work on the *Technograph*, Ed keeps himself busy with such things as intramural handball and basketball. He's a member of the Illumination Engineering Society and the AIEE-IRE.

Ed is twenty-five years old and was married last summer. He and his wife live in Chicago; while on campus, Ed resides at Hill Hall.

Ed will graduate in February, 1951 (he was out of college one semester, the fall of 1949). He hopes to coordinate his interest and knowledge of art and illumination engineering by securing a position as illumination designer, perhaps with an architect.

DEAN FELTON

Almost any time during the day that you stop in 213 Civil Engineering Hall, you will see Dean Felton at the ASCE or *Technograph* desk.

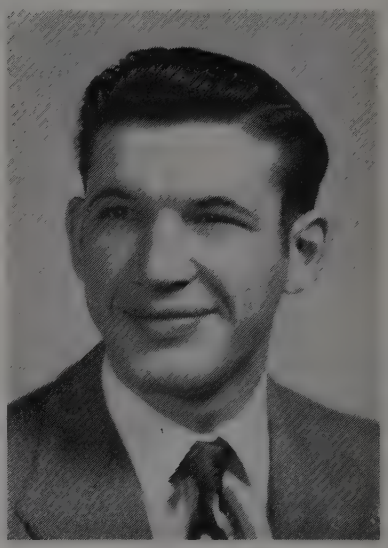
Dean was born in Kewanee, Illinois, on February 28, 1926. He attended grade and high school at Kewanee. In high school, he was active in the band and dramatic club. He graduated from high school in June of 1944, and was inducted into the Army in July of that year. Dean was assigned to that rapidly disappearing branch of the service, the Mounted Cavalry, at Ft. Riley, Kansas.

After completion of basic training, he was shipped overseas and transferred to the "Mars Brigade." Dean then became a member of the 613th Field Artillery Battalion, which was one of the two groups that handled the mule pack artillery on the Burma Road. After adding two battle stars to his souvenir collection, he assisted in training Chinese artillerymen. From this position, he was transferred to the Chinese theatre command, Cargo Division motor pool, at Shanghai. Sgt. Dean Felton was honorably discharged on July 27, 1946.

Dean resumed his interrupted education at the Galesburg division in February of 1947. In November of that year, he aided in the organization of the Galesburg division of the *Technograph*. He transferred to Urbana in February of 1949. Dean was married to Shirley Wilson, also of Kewanne, on June 12, 1949.

Dean continued to work on the Technograph staff after his transfer, and is now holding the position of assistant editor. Last year he won the third place award in ECMA competition for the best student article. He has been active in the student branch of ASCE for two years, now holding the position of secretary of the local chapter. He is also a member of ITE.

Dean is majoring in highway engineering, and will graduate in February.



DEAN FELTON

At the present time, he is hoping for a job in his chosen field. If he attacks it with the vigor that he does his other activities, we are sure that he will make it a success.

BERNARD PESKIN

Quite a few husbands and wives on campus continue with college after their marriage, but few such couples have had the unusual success of Mr. and Mrs. Bernard Peskin. M.E. instructor Peskin and his wife entered Illinois together as freshmen, and both of them received their bachelor's degrees here. Mr. Peskin graduated as a member of Sigma Tau and also of Pi Tau Sigma, the M.E. honorary, while Mrs. Peskin made Phi Beta Kappa and Bronze Tablet. You can't do much better than that.

After graduating from high school at New Rochelle, New York in 1939, Mr. Peskin majored in chemistry at Long Island university. Early in 1941 he interrupted his college career to enlist in the Army. Following his discharge four years later, he and his wife, whom he had married in 1942, entered Illinois as freshmen. Mr. Peskin went into mechanical engineering, while Mrs. Peskin entered the LAS college.

As well as being a member of Sigma Tau and president of Pi Tau Sigma, Mr. Peskin was active in the ASME. He also revived the mechanical engineering senior banquet after the war and in

(*Continued on Page* 16)

honorary and society news

by Chuck Wade, M.E. '52

AFS

The American Foundrymen's Society met December 14 to hear Mr. Charles Drury of General Motors Foundry in Danville, Illinois, talk on "Foundry Practice."

Mr. George K. Dreher, executive director of the Foundry Educational Foundation, spoke at the January 11 meeting.

With future meetings in mind the men with the sand in their hair are contacting William Phillips, director of the Products Development department of Steel Founders Society of America; J. Lansing, technical research director of Malleable Founders Society; C. Burgess of Gray Iron Founders Society; Irv Dennen of Beardsley and Pieper Co.; and N. J. Dunbeck of Eastern Clay Products Co.

AIEE-IRE

Colored slides of Europe were shown by G. H. Fett and E. C. Jordan of the EE faculty to illustrate their talk on their field trip to Europe last summer. The AIEE-IRE members at the December 14 meeting also heard a comparison of the European and American engineering school practices, which Mr. Fett and Mr. Jordan made after visiting schools and industrial plants in Europe.

Plans were made for the Annual Senior Faculty Banquet which is to be held near the end of the semester in January. The hard working committees of the affair are: Dick Didier, Ed Stelter, Roger Trapp, Ron Mackin on entertainment and special effects headed by Bob Solem.

A field trip is planned for the second week of classes in February. The itinerary of the trip includes a visit to the Abbott Power Lab, the Betatron Lab, and the EE Vacuum Tube Lab.

SIGMA PHI DELTA

Delta chapter of Sigma Phi Delta fraternity was host chapter to the Eastern Province Convention of the fraternity held on December 2 and 3, 1950. Speakers at the formal meeting included Russell Smith, grand president; Warren Porter, general manager; John Gray, Central Province councilor; and Robert J. Beals, Eastern Province councilor. Arnold Sauers and Vincent Janis were delegates from Delta chapter. Adolph Brux, chapter president, was convention chairman. Mr. Beals, ceramic engineering department, was reelected province councilor for two more years. He is also chapter councilor and alumni advisor of Delta chapter. At the informal meeting, held on Saturday evening, Mr. Beals showed color slides of California scenery.

A Christmas dance, Holly Hop, was held at the chapter house on December 9. Mr. and Mrs. Hugh Connolly, civil engineering, were chaperones. The annual Christmas dinner was held Sunday, December 17, and the Christmas party, with the exchange of humorous gifts was held around the Christmas tree on Tuesday, December 19.

An informal smoker at the chapter house was held for engineering freshmen on Sunday, December 17.

SIGMA TAU

Sixty-seven pledges were initiated into this all-engineering honorary fraternity on the sixth of December. With the initiation complete, the group adjourned to the Inman hotel for the banquet where Professor "Buck" Knight held forth as toastmaster.

Professor C. L. Coates, the chapter advisor, gave the talk of the evening in which he told of the responsibilities of an engineer and of the added responsibilities of a Sigma Tau member.

On Tuesday, January 9, a business meeting was held for the purpose of nominating officers for the coming year. The elections are to be held Tuesday, February 20, in 105 CEH.

ITE

It was decided at the meeting held on December 19 that the student branch of the ITE would undertake a job which should interest a lot of people out of engineering and even off the campus. The group, headed by president Andrew Sutherland, Martin Blachman, and Robert Cox, will conduct a survey of traffic conditions on Daniel street. This east-west street is noted for heavy traffic and snarls, and has received considerable critical attention from sources including *The Daily Illini.*

Professor C. C. Wiley of the CE department, faculty advisor of the society, will assist in the investigation, and make available equipment of the type used by the state highway department. The study will include traffic volume and movements and speed records. After the survey is completed a report will be compiled, and this report, with recommendations for remedies, will be offered to the Champaign city council.

This is an interesting and highly useful project, and shows that an active engineering society can not only give its members valuable practical experience, but make a real contribution to the public.

Business at the meeting also included the showing of four short films. Two of them, "Night and Bad Weather Driving" and "You Bet Your Life" were supplied by the visual aids department, and two more, on tires and automatic transmissions, were obtained from Sullivan Chevrolet in Champaign. In addition, plans were made for the annual dinner to be held shortly after the Christmas vacation.

ASME

The ASME tried a "first" on December 15. It was the first Friday evening meeting that they had ever sponsored and judging from the capacity crowd, it was a success.

The speaker of the evening was Forrest Nagler, vice president of Allis-Chalmers, and vice president of ASME, Region VI. He is the chief mechanical engineer of Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin, formerly with the foundry department of the same company. In spite of the long title he is weighed down with, Mr. Nagler gave an interesting talk on "Bikini, The Human Side." Mr. Nagler was well fitted to give a talk on this subject because his chief assignment during World War II was in connection with the production of heavy machinery used for the manufacture of atomic bomb material. This work included his trip to be an eye-witness of the second or underwater burst at Bikini.

(*Continued on Page* 14)

no final exams . . .

. . . for graduating seniors was a plan conceived and laid out last spring by Engineering Council.

The original proposal embodied the plan in the following words:

"The Engineering Council requests . . . (the adoption of) the policy of exempting graduating seniors from final examinations and (thus) advancing the date of commencement exercises."

The refining and acceptance of this plan by the Council was just the first step of a long procedure to have the plan become an accepted part of University routine. In the next move, members of the Engineering college faculty were interviewed and the number of favorable opinions was an overwhelming majority. The third step was submitting the plan to other college councils—those of Commerce, L.A.S., and Agriculture—to have them take individual action within their own colleges. Here, too, with the exception of L.A.S., the plan found favor with both faculty and students.

In the near future, the plan will be submitted to the Executive committees of each of these colleges. If these committees and the Deans approve the plan, as the polls seem to indicate they will, the plan will then be submitted to the University Senate for final approval.

The DAILY ILLINI and the councils have publicized this plan, but it is through individuals spreading around the news by word of mouth that may help this plan materialize in time to exempt June, '51, graduates. We, as engineers, can pass on the merits of this plan, and if action is taken quickly, our graduating class may be the first to benefit.

Drill Night

From a point high on the campus, a radar beam searches the sky. Lights burn in classrooms. Khaki replaces tweed and covert for the night as college men assigned to Reserve units study the machines and methods of defense.

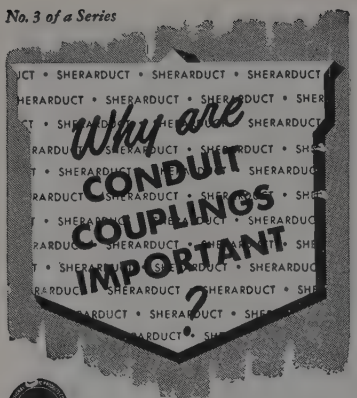
Preparedness is the order of the day.

And the Bell System stands prepared. In five busy years, we have added more than 12,500,000 telephones. Many improvements have been made in the quality and speed of service. Our force of highly skilled, experienced men and women has been greatly enlarged—and now numbers more than 600,000.

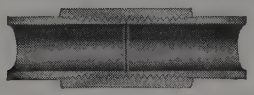
A nation in a hurry goes by telephone. This country has the best telephone service in the world.

BELL TELEPHONE SYSTEM

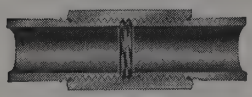
No. 3 of a Series



When two lengths of electrical conduit are joined together, ordinarily the point of coupling becomes the weakest part of the run. For this reason the coupling is all-important. And for this reason a Sherardized coupling has special advantages over other types.



SHERARDUCT COUPLING



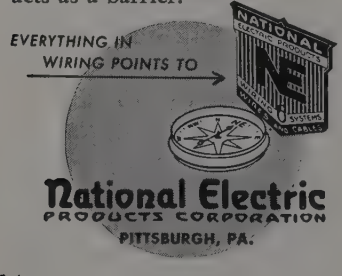
ORDINARY COUPLING

A Sherardized coupling is galvanized *after* the threads are cut—every thread is zinc protected against rust equally with the outside surface.

The shoulder on Sherarduct couplings is a further safeguard. It covers and protects the final threads so that no raw threads will be exposed to moisture and other corrosive weather conditions.

Sherarduct conduit threads are so cut and couplings so tapped causing conduit to butt, that together they form a practically continuous raceway through which wires may be drawn without difficulty or injury.

Here at the joint, unless perfect continuous grounding is assured as it is with Sherarduct, rust first begins its resistance activity and acts as a barrier.



SOCIETIES . . .

(*Continued from Page* 11)

Along with the talk was shown the film "Crossroads" which showed the operations before, during, and after the two Bikini bursts.

After the meeting, to quench the thirst and fill the stomachs of those attending, "cider and donuts" were served in the MEB student lounge.

The University of Illinois ASME branch is to be the host for the Annual Regional Student Conference in Peoria this spring. The dates of the conference are April 26 and 27. It will be held in the Jefferson hotel in Peoria. One of the main features of the sessions will be the contest in which student research papers will be entered. To be eligible to enter this contest, the paper must have previously won the school's branch student paper contest. The local contest will be sometime in March. The two hundred and three members of the local branch of the ASME are eligible to enter this contest.

IAS

The officers of the Institute of Aeronautical Sciences are as follows: Harvey A. Wallskag, chairman; Loren Anderson, vice chairman; Eldon McKinney, secretary-treasurer.

At the December 6 meeting movies were shown and in the business meeting, the student-faculty banquet was dropped in favor of a spring picnic. Corliss Laisure was appointed picnic committee chairman. He is to investigate the possibility of having the picnic at Allerton park.

MIS

"Minerals on Russian Borders and What They Mean," was the timely topic chosen by Dr. Walter H. Voskuil, professor of mineral economics and mineral economist for the State Geological Survey, when he spoke to the December 13 meeting of MIS. Dr. Voskuil supplemented his talk with slides, maps and charts which pertained to his talk.

During the business meeting, the announcement was made that Mr. Paul R. Nichols, superintendent of the Wisconsin Steel Works, would be the Career Conference speaker for the metallurgical engineers. It was also announced that since he would be unable to attend, a substitute would be needed for Mr. Henry Woods, chairman of the board of the Sahara Coal Co., who was to have spoken to the miners.

At the January 11 meeting of the MIS, Mr. George K. Dreher, executive director of the Foundry Educational Foundation, was the speaker. Plans were being formulated for a farewell party for graduating seniors in mining and metallurgy.

ASCE

The University of Illinois student chapter of the American Society of Civil Engineers held their third meeting of the semester in the form of a joint dinner meeting with the Central Illinois section of ASCE. The meeting was held on December 5 in Latzer hall, YMCA.

Mr. A. L. R. Sanders, chief engineer for Hazelet and Erdal, consulting engineers, and president of the Central Illinois section ASCE was the speaker for the evening. Mr. Sanders' topic was: "Design and Construction of Recently Completed Mississippi River Bridge." This talk was very nicely illustrated with fifty colorful slides and dealt with many of the phases of the St. Louis bridge.

As the meeting was chiefly a social dinner meeting, no business was conducted.

ASAE

M. W. Forth and L. S. Foote, USDA, reported to the ASAE at their meeting December 12 on the progress that they have made over the past two years in the development of automatic feed grinding for the farm. Color movies and slides were shown of the operation of some of the installations throughout the state. The use of special controls and the elimination of the many "bugs" were explained.

During the business meeting, membership cards were distributed and a committee was appointed for operation of the lunch stand during Farm and Home week. Cider and doughnuts were served for refreshments.

SAE

At the December 6 meeting three movies were shown; "Gold Cup Races" and two color films — "Behind the Checkered Flag," and "The Grand Canyon Run."

During the following business meeting nominations were made for chairman, vice chairman, recording secretary, corresponding secretary, and engineering council representative.

The February 21 meeting will feature a talk by R. J. Greenshields entitled "150 Miles to the Gallon is Possible." Mr. Greenshields wrote an article on this topic which was published in a recent issue of the SAE Journal.

"Daddy," queried the son, "what is the person called that brings you in contac with the spirit world?"

"A bartender, my son," replied the father.

Wetter Water is on the job

THE SMOKE SWELLS . . . the flames roar . . . firemen push into the heart of the conflagration behind a wall of spray. Then almost as if by magic the crackling flames die down . . . the fire is out.

Wetter water is on the job again!

What is this remarkable fire fighting tool? How can water be *wetter?* The answer is an astonishing chemical called Unox Penetrant.

Add as little as one per cent of Unox Penetrant to water and a wonderful change takes place. The water actually becomes wetter . . . spreads rapidly and evenly . . . sinks almost instantly into any even slightly porous surface.

Sprayed on burning wallboard, wood, even bales of cotton—wetter water penetrates below the burnt outside to the fire beneath . . . puts it out faster with less than one-third of the water usually needed.

Fire departments find that Unox Penetrant reduces fire, smoke and water damage . . . makes the fireman's work safer and more efficient. It is but one example of the hundreds of materials produced by the people of Union Carbide. Among these products there is certainly one or more that will be of value to your business.

FREE: *Learn more about the interesting things you use every day. Write for the illustrated booklet "Products and Processes" which tells how science and industry use Union Carbide's Alloys, Chemicals, Carbons, Gases and Plastics in creating things for you. Write for free booklet H.*

UNION CARBIDE
AND CARBON CORPORATION
30 EAST 42ND STREET UCC NEW YORK 17, N. Y.

Trade-marked Products of Divisions and Units include

SYNTHETIC ORGANIC CHEMICALS • LINDE Oxygen • BAKELITE, KRENE, and VINYLITE Plastics
PREST-O-LITE Acetylene • PYROFAX Gas • NATIONAL Carbons • EVEREADY Flashlights and Batteries
ACHESON Electrodes • PRESTONE and TREK Anti-Freezes • ELECTROMET Alloys and Metals • HAYNES STELLITE Alloys

INTRODUCING . . .

(*Continued from Page* 10)

addition he organized the SAE here on campus. Along with his other activities he was a member of the Engineering Council.

BERNARD PESKIN

Mr. Peskin has continued to be interested in the Engineering Council. Today he is an advisor and one of its staunchest supporters. He does have a few suggestions about making the council more effective, such as including the honoraries in the council and aiding the various societies by bringing good technical speakers to the campus. He is also very much in favor of the ISEE, maintaining that one of the main functions of the council is to introduce high school students to engineering as a career.

Mr. Peskin has been teaching in the ME department since his graduation, specializing in internal combustion engines, and will receive his Master's in February. Afterwards he would like to continue teaching at Illinois and start on his Ph.D.

Father: "What do you mean by bringing my daughter at this hour of the morning?"

Engineer: "Have to be in class by eight."

* * *

A supersalesman is a fellow that can sell the possessor of a Tau Beta Pi key a double-breasted suit.

* * *

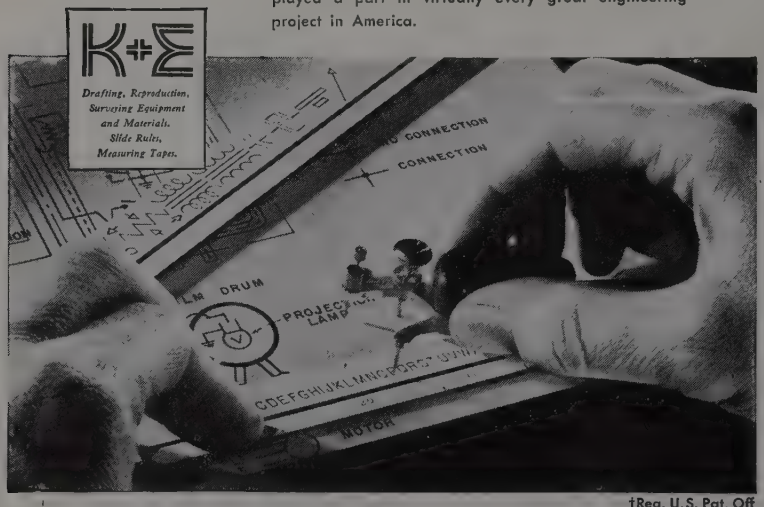
A freshman engineer is a young man who knows why a strapless evening gown is held up, but doesn't yet know how.

Then there is the Scotchman who rode in a cab with his girl. She was so beautiful that he could hardly keep his eyes on the meter.

THANKS VERY MUCH, BUT I THINK I CAN MANAGE!

partners in creating

For 81 years, leaders of the engineering profession have made K & E products their partners in creating the technical achievements of our age. K & E instruments, drafting equipment and materials—such as the LEROY† Lettering equipment in the picture—have thus played a part in virtually every great engineering project in America.



†Reg. U.S. Pat. Off

KEUFFEL & ESSER CO.

EST. 1867

NEW YORK • HOBOKEN, N. J.
Chicago • St. Louis • Detroit
San Francisco • Los Angeles • Montreal

VALENTINES
VALENTINES
VALENTINES
for
Everybody

A Selection of the Best from Many Makers

To Love is to Remember Family, Sweetheart, and Friends by Valentines from

★

STRAUCH'S
AT CAMPUS
709 So. Wright, Champaign

New television microphone, developed at RCA Laboratories, virtually vanishes when in active use.

Vanishing Microphone lets the stars shine

Now you see it, now you don't! RCA's new "vanishing microphone" is plainly visible when standing alone—but let a television performer stand before it and it seems to disappear.

Called the "Starmaker," this RCA microphone is little larger than a big fountain pen . . . and principles of design based on modern camouflage techniques blend it with an artist's clothing. There's no clumsy "mike" to distract your attention from the artist's performance—and it's also a superbly sensitive instrument.

Through research carried out at RCA Laboratories, the "Starmaker" microphone picks up sound from all directions—hears and transmits every sound the human ear can detect. It's not only small and almost invisible, but it's also one of the most efficient microphones ever devised.

* * *

See the latest wonders of radio, television, and electronics at RCA Exhibition Hall, 36 West 49th Street, New York. Admission is free. Radio Corporation of America, RCA Building, Radio City, New York 20, N. Y.

Continue your education with pay—at RCA

Graduate Electrical Engineers: RCA Victor—one of the world's foremost manufacturers of radio and electronic products—offers you opportunity to gain valuable, well-rounded training and experience at a good salary with opportunities for advancement. Here are only five of the many projects which offer unusual promise:

- Development and design of radio receivers (including broadcast, short wave and FM circuits, television, and phonograph combinations).
- Advanced development and design of AM and FM broadcast transmitters, R-F induction heating, mobile communications equipment, relay systems.
- Design of component parts such as coils, loudspeakers, capacitors.
- Development and design of new recording and producing methods.
- Design of receiving, power, cathode ray, gas and photo tubes.

Write today to National Recruiting Division, RCA Victor, Camden, New Jersey.

Also many opportunities for Mechanical and Chemical Engineers and Physicists.

RADIO CORPORATION of AMERICA

World Leader in Radio — First in Television

RESEARCH . . .

(*Continued from Page* 6)

home conditions. In one of these homes, warm-air heating systems are being tested; in the other, steam-heating systems. Radiant base-boards were largely developed in the steam-heated home; radiant ceiling panels have also been tested. To accomplish the testing purposes, small pipes running from floor to ceiling of the living room, hold thermocouple wires that measure the temperature at every height in the room.

electronic "brain"

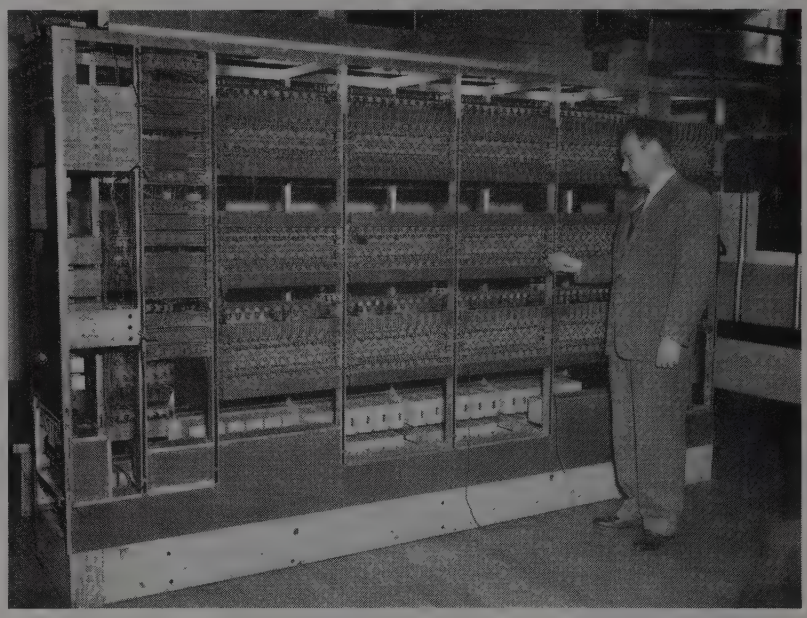
Under a program of the Graduate College and the direction of Professor Ralph E. Meagher, an electronic computer is under construction in the Electrical Engineering Research Laboratory.

Units are being added to the already large machine until eventually each unit will enable the computer to do 21 different arithmetical tasks.

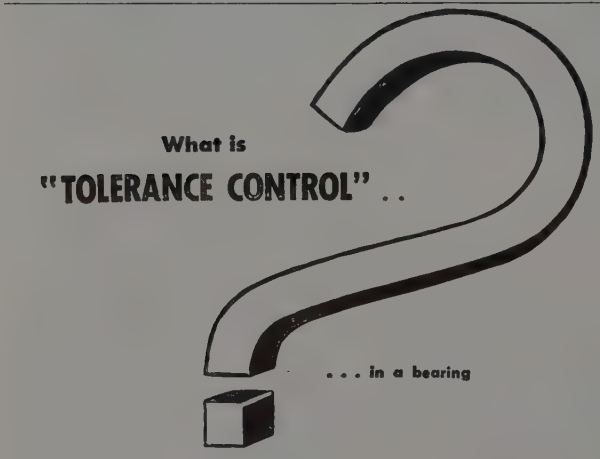
The speed with which the brain can operate will be useful for complicated or extensive mathematics in many fields ranging from nuclear physics to social sciences. In recent tests, the machine performed 52,000,000 multiplications in an 18-hour session and will eventually do problems in short order that no human mathematician would live long enough to complete. Reputed to be faster than any other mechanical or electrical "brains" now in existence, the entire structure will be completed in another one and one-half years.

Now under assembly is the "memory" unit of the machine. This involves 40 cathode ray tubes, like small television screens. Each will have 1,024 green

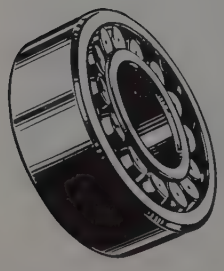
(*Continued on Page* 20)



The electronic brain, a digital computer, can do 52,000,000 multiplications in eighteen hours even though it is not yet completed.



You don't want tolerances too great . . . and you don't want tolerances closer than the job demands. But you want to be sure that tolerances are *right* . . . are *always* properly controlled . . . *always* meet established standards. At SKF, ceaseless vigilance in every stage of production assures complete control of tolerance throughout the manufacturing cycle. SKF Industries, Inc., Phila. 32, Pa. 7177



SKF
Ball and Roller Bearings

Watches
•
ELGIN
HAMILTON
BULOVA
OMEGA

Diamonds
•
KEEPSAKE
ENGAGEMENT
AND
WEDDING
RINGS

The Finest in Diamond Rings, Watches, Gifts
Visit Our Watch Repair Department
607 E. Green Street, Champaign
Serving Illini Since 1931

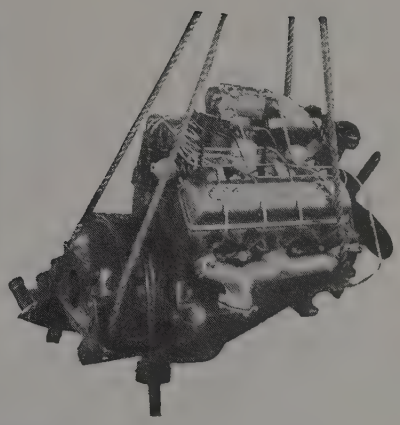
Drafting Room Supplies

Counters — Map Measures — Contour Pens
Jackknife Pens — Proportional Dividers
Sliding Parallel Rules — Scales — Wrico Pens
All Leroy Pens and Templates — Graph Papers
Drawing Tables

MAIL ORDERS

UNIVERSITY BOOKSTORE
610 E. Daniel, Champaign

THE DU PONT DIGEST



On the road and in the laboratory, Du Pont scientists are writing

The Inside Story of Engine Deposits

Engineers have long known that deposits which accumulate in gasoline engines have a direct bearing on engine performance. Even now, however, no way has been found to eliminate these deposits or their effects.

As a manufacturer of chemicals used by the petroleum industry, the Du Pont Company has a particular interest in this problem. It is currently the subject of a comprehensive research project, conducted both on the road and in the laboratory.

When Du Pont engineers began their studies, some aspects of the relationships between engine, fuel, lubricant, operating conditions and deposits were known. But to understand how and why deposits form and to develop corrective measures, they needed additional information.

Engineers take to the road

To get these facts, Du Pont engineers are supervising tests in a fleet of passenger cars and trucks that travel hundreds of thousands of miles yearly under carefully controlled conditions. The effects of deposits on octane number requirement, valve performance, spark plug condition and other performance characteristics are measured. After each test, the deposits are weighed and examined physically and chemically.

In the laboratory, other engineers study the effects of the same variables on multicylinder engines. Here, where closer control of the engines is possible, greater attention can be paid to specific fuel or engine operating effects. Performance factors, such as power output, can be more conveniently measured.

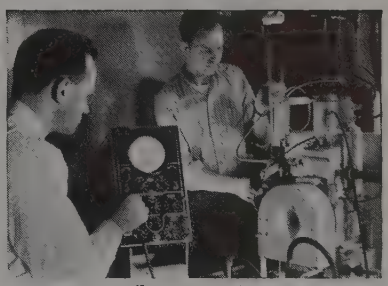
A third group of Du Pont engineers uses single cylinder engines in laboratory studies of deposit formation, adhesion, removal and harm. Exploring new fields, these men had to design complex instrumentation for measuring factors such as surface condition and deposit thickness.

Chemists synthesize deposits

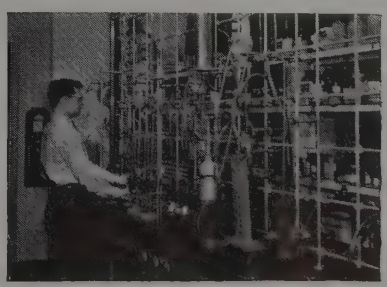
Chemists, too, have an important place in this research. They study the chemical and physical characteristics of engine deposits. Among other things, they devise ways of synthesizing, in fired engines, deposits consisting almost entirely of a single chemical compound in order to study its effect on engine performance.

The results of this comprehensive research program are not yet conclusive, although the relationships between engine, fuel, lubricant, operating condition and deposit formation and harm are much better understood. In the past Du Pont scientists have licked even more difficult problems. Working as a team, they will persist in their effort to provide the motorist with improved engine performance through better fuels.

Douglas L. Schultz *(center), B.S. in M.E., M.I.T. 1947, supervises installation of engine for study of deposit formation in truck operating under heavy-duty conditions.*



W. E. Bettoney *(left), B.S. in M.E., Maine 1939, tests installation of single-cylinder gasoline engine used in study of factors influencing deposit formation in the combustion chamber.*



H. K. Livingston, *Ph. D. in Phys. Chem., Chicago 1941, operates apparatus for measuring porosity and absorptivity of combustion chamber deposits taken from test engines of the Du Pont automobile test fleet.*

DID YOU KNOW . . .

. . . about 60% of Du Pont's sales today consist of products that didn't exist or weren't commercially available 20 years ago.

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Entertaining, Informative — Listen to "Cavalcade of America," Tuesday Nights, NBC Coast to Coast

RESEARCH . . .

(*Continued from Page* 18)

dots on its surface. The dots can change to dashes, and through this code 1,024 twelve-digit numbers can be "remembered"; or instructions to the machine, coded as numbers, can be stored for use in the lightning-speed calculations.

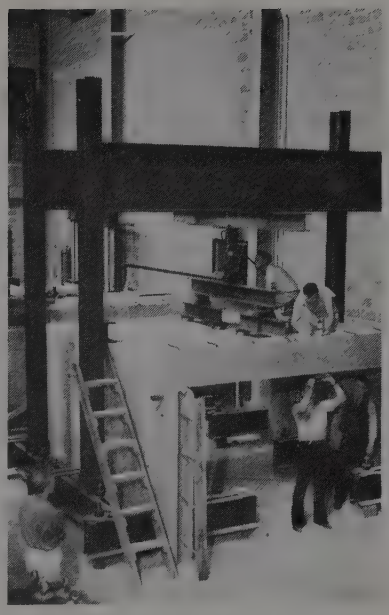
A command unit will pass instructions around inside the computer at a rate no human brain or nerves could equal. Until this is completed, tests such as the 18-hour multiplication marathon are simply repetition of the same task with the same numbers over and over again. With the command unit the computer will be versatile.

Finally there will be the input-output unit, translating numbers to and from the machine's digital system or electric pulses. Operators at a typewriter-like keyboard will perforate a paper tape with the data and coded instructions for the computer. The answers will be printed on a sheet of paper like that from a teletype.

vacuum tubes

Illinois is one of the few universities having a full-scale model shop that can make vacuum tubes to any experimental design. The shop is well-equipped with a hydrogen furnace for heat-treating the inside of the tubes, a high-power radio-wave generator that heats the joints to produce glass-to-metal air-tight junctions, and glass lathes for the actual glass fabrication.

Many of the electronic tubes that were used in the construction of the electronic "brain" came from this shop. Other tubes that have been developed are improved types of magnetrons, klystrons, and traveling-wave tubes. The first two types were used in war-time radar equipment, but were either built to operate at only a single fixed radio frequency, or else were tunable over a narrow range. Emphasis in this research has been placed on the development of single tubes that can be tuned continuously over a very wide range of frequencies.



Talbot Laboratory is the scene of much research in structural engineering. Bridge frames, such as the one above, can be tested in full-size section in the large (4 stories high) central court.

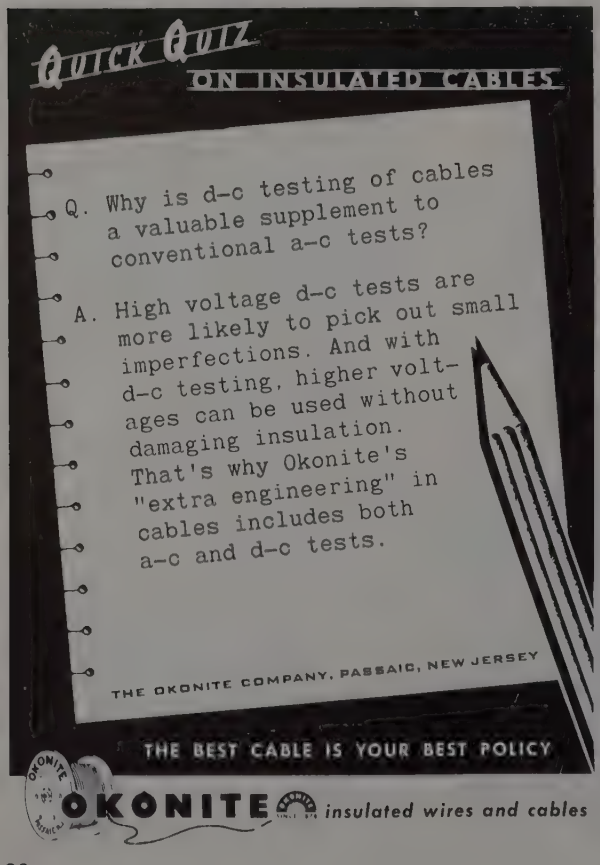
Connect 20,000 volts across a pint. If the current jumps it, the product is poor.

If the current causes a precipitation of lye, tin, arsenic and iron slag, the whiskey is fair.

If the liquor chases the current back into the generator, you've got good whiskey.

* * *

A long skirt is like prohibition—the joints are still there, but they're harder to find.


QUICK QUIZ
ON INSULATED CABLES
Q. Why is d-c testing of cables a valuable supplement to conventional a-c tests?
A. High voltage d-c tests are more likely to pick out small imperfections. And with d-c testing, higher voltages can be used without damaging insulation. That's why Okonite's "extra engineering" in cables includes both a-c and d-c tests.
THE OKONITE COMPANY, PASSAIC, NEW JERSEY
THE BEST CABLE IS YOUR BEST POLICY
OKONITE
insulated wires and cables

Books and Supplies

for every engineering need

★

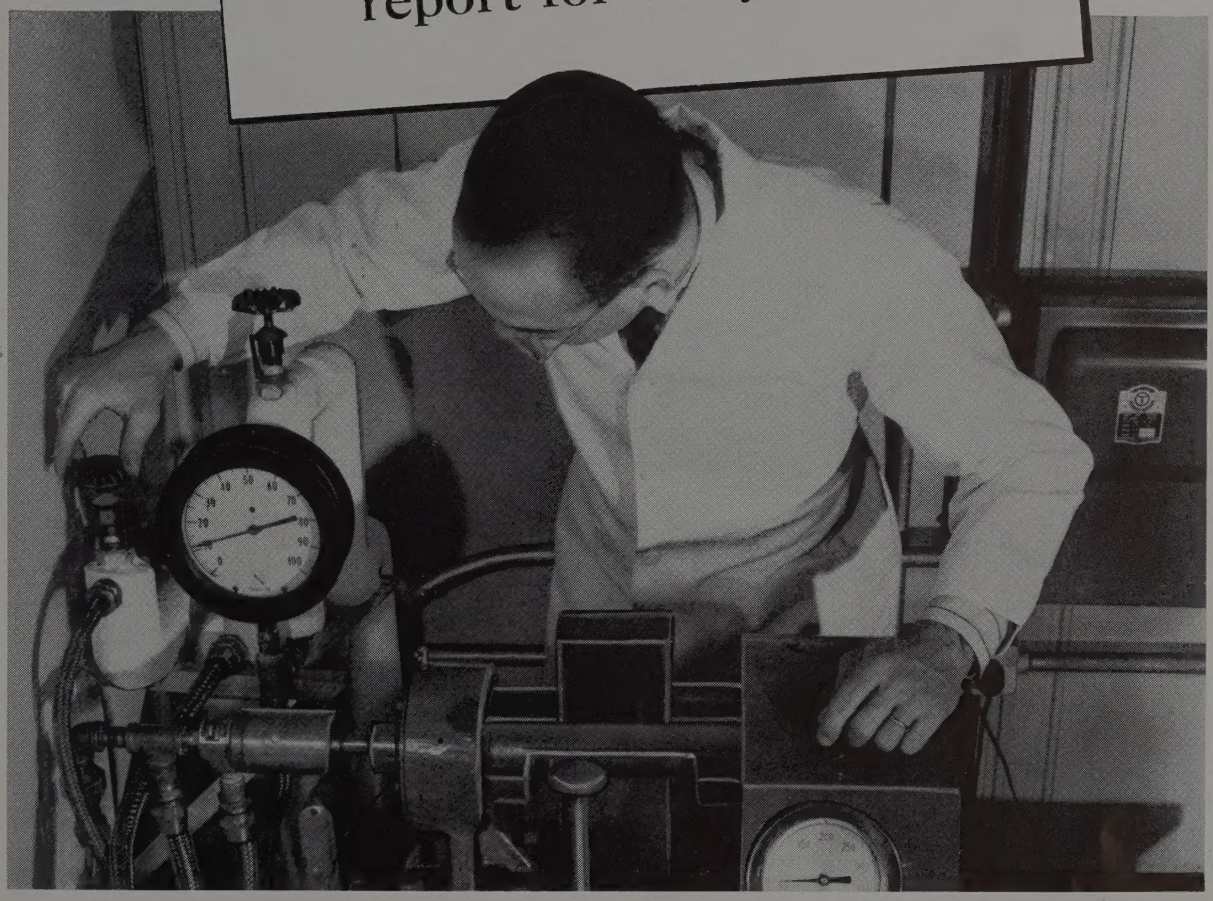
ILLINI UNION BOOKSTORE

★

715 SOUTH WRIGHT STREET

ON THE CAMPUS

We have good news to report for the journals



SOME JOURNALS are technical publications. Some journals are the parts of rotating shafts that turn in bearings.

For both kinds of journals, there's good news in Standard Oil's performance testing program. One result is a new testing device for mill and locomotive driving-journal grease that enables us to tell more accurately than ever before what our greases will do under actual conditions of use. That, in turn, enables us to proceed more directly with the job of making our greases still better.

Standard Oil took the lead in performance testing, and is a leader today. During the war our tests furnished information that enabled the Army to procure certain products with greatly increased reliability of performance. Some of our tests have become a part of government specifications. Many users of our products are benefiting, both from better products and from more accurate information.

As time goes on, we are doing more and more performance testing. In some cases, we have to develop not only the tests but also the testing equipment. But to Standard Oil researchers and engineers, any effort is worth while if it will help make better, more useful petroleum products.

Standard Oil Company

(INDIANA)

STANDARD

MORE TECHNOCRACKS . . .

The Scotchman had blown his girl to a movie, and hailed a cab to take her home. When he assisted her in, she, knowing his natural bent where money was concerned, remarked, "Oh, Jock, it makes me feel awfully wicked, riding around with you like this."

At that Jock was cheered up tremendously. "Then, mebbe," quoth he, "it'll be worth the money after all."

* * *

Customer: "Have you a book called "Men, Master of Women?"

Salesgirl: "The fiction counter is to your left, sir."

* * *

You are a dear, sweet girl
God bless you and keep you
I wish I could afford to.

* * *

Late to bed and early to rise,
Makes a man saggy, draggy,
And baggy under the eyes.

* * *

The two biggest wolves to date are Chase and Sanborn—they date every bag.

* * *

Freshman: "What is the toll on the Wheatstone Bridge?"

Junior: "Daddy, what's a sweater girl?"

Dad: "Why, er—uh, a girl that works in a sweater factory." And after a minute's pause, "Say, where did you get that question?"

Junior: "Never mind that, Daddy—where did you get that answer?"

* * *

When women go wrong, men go right —after them.

* * *

First Student: "How's your insomnia?"

Second Student: "Worse. I can't even sleep when it's time to get up."

* * *

He told her of his love
The color left her cheeks
But on the shoulder of his coat
It showed for weeks and weeks.

* * *

The best place to hold the world's fair is around the waist.

* * *

The modern mechanical genius is one that can shift gears in an Austin without getting his face slapped.

* * *

Sign on the rear of a Crosley: "Hit someone your own size."

A farmer's wife became mentally deranged. As they carried her from the house in a strait jacket he remarked, "Shore don't know what could have got into her—she ain't been out of the kitchen in 25 years."

"And now, with Mr. Riley's permission, we'll return to the anatomy of the frog."

Right: Ice-making Tanks

Frozen Food Storage

Big Plant at Nampa, Idaho, Makes 500 Tons of Ice a Day with Frick Refrigeration

And quick-freezes 5 tons of fresh foods per hour at another plant, 600 feet away! Five cold storage rooms hold 2500 tons of ice and 85 carloads of frozen foods.

Seven large Frick ammonia compressors carry the cooling load. They were selected for this Terminal Ice and Cold Storage Co. plant by the Associated Refrigerating Engineers, Los Angeles consultants.

You can specify Frick refrigerating, ice-making and air conditioning equipment with confidence.

The Frick Graduate Training Course in Refrigeration and Air Conditioning, Operated over 30 Years, Offers a Career in a Growing Industry.

Above: Air View of Plant

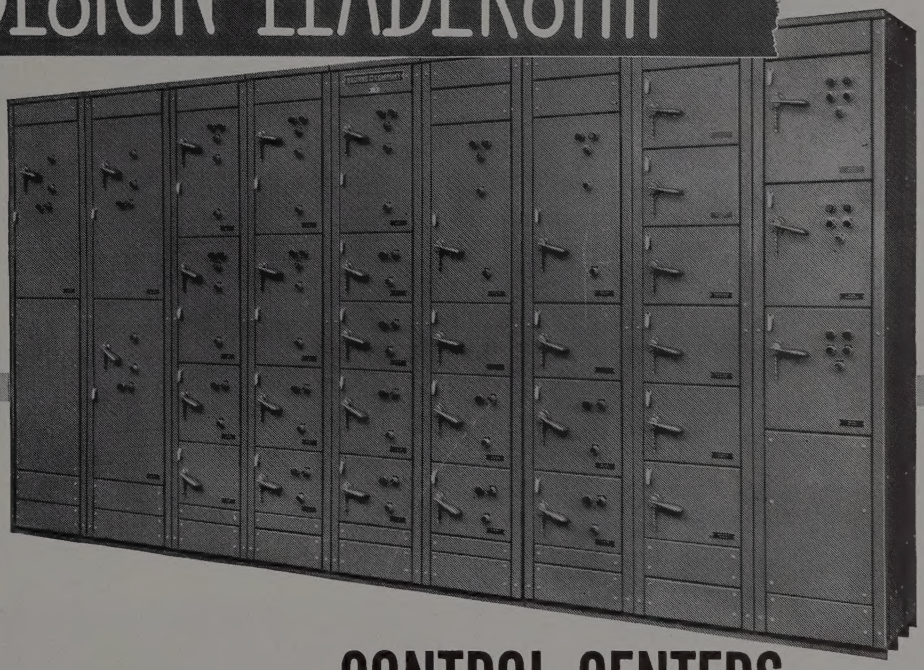
DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U.S.A.
Also Builders of Power Farming and Sawmill Machinery

Right: 5 of 7 Frick Compressors, Totaling 1600 Horsepower

SMART ENGINEERS
Use The
HELPIE SELFIE
SELF-SERVICE LAUNDRY
★
403 East Green Street, Champaign

Robeson's
Champaign's Largest Department Store
★
Serving Champaign County Since 1874

DESIGN LEADERSHIP



SQUARE D CONTROL CENTERS
provide MORE control in the SAME space

SQUARE D CONTROL CENTERS have provided substantial space savings in 70% of recent installations. The compact design of Square D starters and circuit breakers permits side-by-side mounting through SIZE 3. Free standing vertical sections have mounting provisions for individual control units built to minimum heights based on 3" steps. Each section has 78" height available for units. SIZES 1 and 2 non-reversing starters are 12" high; SIZE 3 is 15" high.

The control center illustrated above shows typical Square D space economy. The following is incorporated in only 188" L x 90" H x 20" D:

SECTIONS 1 AND 2 *(left to right)*—three starters and one space for 75 H.P. motors.

SECTIONS 3 THRU 7—two-speed starters for five 15/3.7 H.P. and two 30/7.5 H.P. motors. Starters for five 30 H.P., four 10 H.P. and two 2 H.P. motors. Three 50A frame branch circuit breakers.

SECTION 8—Six 50A frame branch circuit breakers.

SECTION 9—Three reversing starters and one space for 7 1/2 H.P. motors. (Pilot lights and push-buttons are mounted in covers without increasing standard unit sizes

If Space ... *tures:*

Plug-In ... rners.
Spring ... ver-
tical ...
Safe ... oor
and ... nit
door ...
Wiring ... ach
sectio ...

FOR NEARLY 50 YEARS

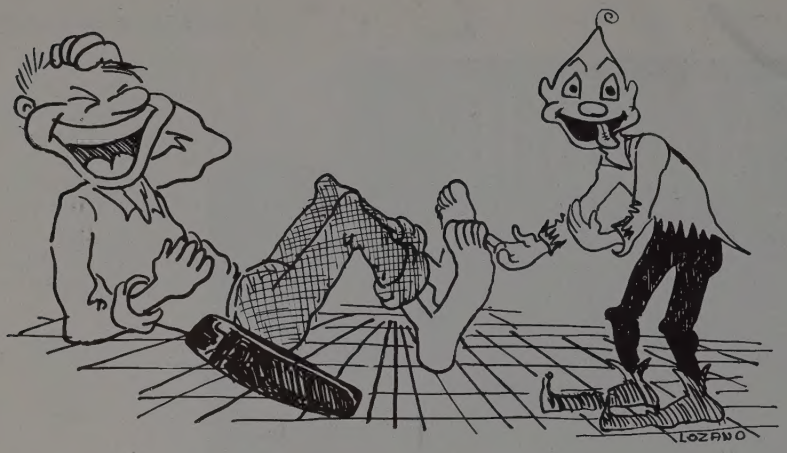
Square D has served industrial, commercial, residential and agricultural America with a broad line of electrical distribution and control equipment. During those years, Square D has earned major recognition and acceptance on two counts: First, consistent **design leadership.** Second, the **unmatched calibre of its Field Engineers**—all of whom come to us from leading engineering schools such as yours.

Write **for Bulletin 8938. Square**
4041 N. Richards Stre

SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES

SQUARE D COMPANY CANADA LTD., TORONTO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.



TECHNOCRACKS

It's not the cough that carries you off,
It's the coffin they carry you off in.

* * *

She: Take back your diamond ring. It's paste.

He: Better keep it girlie, a paste on the hand is worth two in the eye.

* * *

Wolf: One who insists on life, liberty, and the happiness of pursuit.

Every dog has its day but a dog with a broken tail has a weak end.

* * *

Sign in the Library: "Only low talk permitted here."

* * *

Engineers sure have a deep respect for age, if it is over eight years old and bottled.

Little Boy in Woodshed: "Father, did grandpa spank you when you were a little boy?"

Father (with paddle): "Yes, my son."

Little Boy: "And did great-grandpa spank grandpa when he was a little boy?"

Father: "Yes."

Boy: "Well, don't you think with my help you could overcome this inherited rowdyism?"

* * *

Journ Student: "I want a ticket to New York."

Agent: "By Buffalo?"

Journ Student: "That's okay if the saddle's comfortable."

* * *

A censor is a person that can find three meanings in a joke that has only two.

* * *

Sign in bar: Please sit down when the room is in motion.

* * *

Paw, what is a bicuspid?

A bicuspid, my boy, is a double barreled spittoon.

Attention! February Graduates

Join Your Alumni Association Before Leaving

The Campus And Save

	Regular	Special	Savings
Annual	**$ 4.00**	**$ 1.00**	**$ 3.00**
Four Year	**$16.00**	**$ 4.00**	**$12.00**
***Life**	**$80.00**	**$70.00**	**$10.00**

*Convenient payment plan available. All memberships include subscription to Alumni News

Send in your membership or call in person at our office

U. of I. ALUMNI ASSOCIATION

227 ILLINI UNION BUILDING